Volunteer Lake Assessment Program Individual Lake Reports

CRESCENT LAKE, ACWORTH, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	2,925	**Max. Depth (m):**	7.3	**Flushing Rate (yr^{1})**	3.7
Surface Area (Ac.):	116	**Mean Depth (m):**	3.2	**P Retention Coef:**	0.53
Shore Length (m):	5,100	**Volume (m^3):**	1,526,500	**Elevation (ft):**	1215

TROPHIC CLASSIFICATION

Year	Trophic class
1979	MESOTROPHIC
1992	MESOTROPHIC

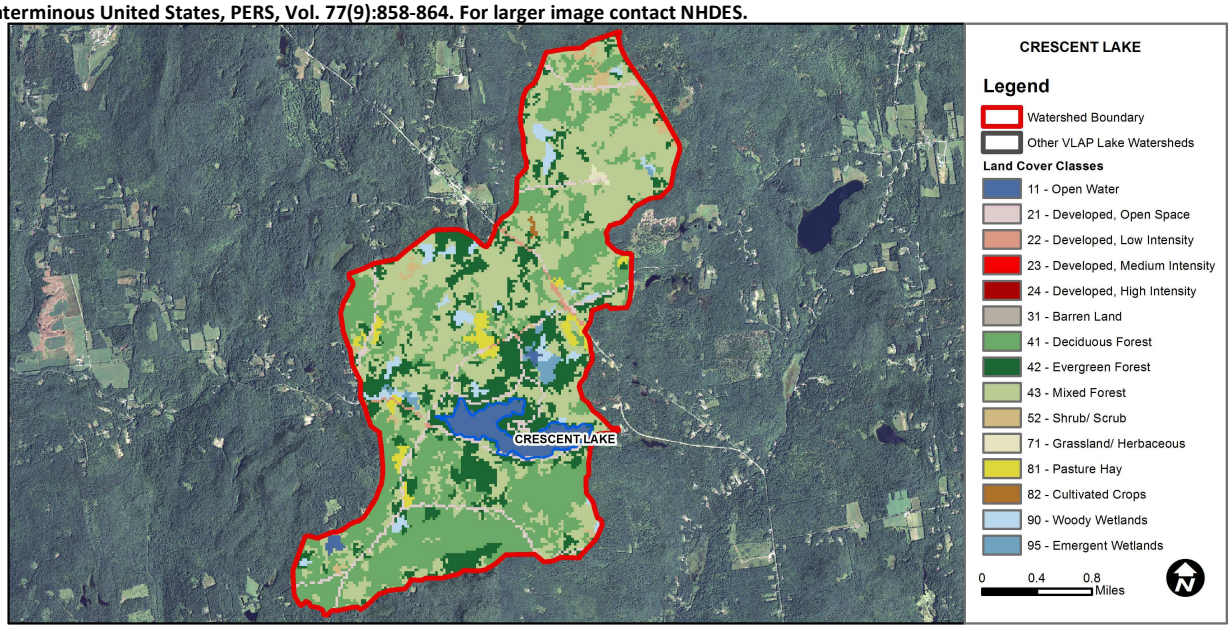
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Cautionary	One exceedance of single sample criteria but not enough data to calcuate geometric mean. More data needed.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	3.91	Barren Land	0	Grassland/Herbaceous	0.16
Developed-Open Space	3.56	Deciduous Forest	31.76	Pasture Hay	1.93
Developed-Low Intensity	0.55	Evergreen Forest	16.45	Cultivated Crops	0.1
Developed-Medium Intensity	0	Mixed Forest	36.96	Woody Wetlands	2.58
Developed-High Intensity	0	Shrub-Scrub	1.31	Emergent Wetlands	0.76

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
CRESCENT LAKE, ACWORTH, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** 2013 chlorophyll levels were elevated, particularly in July and September. Significant spring and early summer precipitation may have contributed nutrients to support excess algal growth. Historical trend analysis indicates relatively stable chlorophyll with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity levels were average for most NH lakes. Historical trend analysis indicates stable epilimnetic conductivity with low variability between years.
- **E. COLI:** West Inlet E. coli levels were less than the state standard for surface waters. This is a positive sign as samples were collected following over two inches of rainfall.
- **TOTAL PHOSPHORUS:** 2013 average deep spot phosphorus levels increased slightly but were within a normal range for the lake. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Northeast Inlet phosphorus level was above average in July. A severe storm event prior to sampling likely caused severe road or stream bank erosion upstream. Field and lab notes indicate moderate stream flow and mud settled to the bottom of the sample bottle and abnormally high turbidity. Historical data indicate an increased phosphorus level in Northeast Inlet since 2011. West Inlet also experienced elevated phosphorus during the same event likely a result of wetland flushing. Outlet turbidity was also slightly elevated in July.
- **TRANSPARENCY:** Lake Transparency decreased as the summer progressed due to the increased algal growth. Historical trend analysis indicates a decreasing (worsening) transparency since monitoring began.
- **TURBIDITY:** Northeast and West Inlets experienced elevated turbidity in July following a significant storm event. This indicate road, stream bank or other erosion occurring upstream of the sample station. Hypolimnetic turbidity was elevated in July and September likely due to organic compounds released when hypolimnetic dissolved oxygen levels are critically low.
- **PH:** Average pH levels were below desirable threshold of 6.5 -8.0 units. Historical trend analysis indicates relatively stable epilimnetic pH with moderate variability between years.
- **RECOMMENDED ACTIONS:** Significant storm events likely contributed nutrients that fueled mid to late summer algal growth. Identify the area(s) contributing to sedimentation in Northeast Inlet and implement best management practices to prevent further erosion. There are several stormwater reference materials available for use such as the "NH Homeowner's Guide to Stormater Management" and the "Environmentally Sensitive Road Maintenance for Dirt and Gravel Roads" manual. Contact the VLAP Coordinator for copies of these documents.

Table 1. 2013 Average Water Quality Data for CRESCENT LAKE

Station Name	Alk.	Chlor-a	Cond.	E. Coli	Total P	Trans.		Turb.	pH
	mg/l	ug/l	uS/cm	#/100ml	ug/l	m		ntu	
						NVS	VS		
#4 West Inlet			57.2	72	32			3.63	5.99
Dam Outlet			42.5		12			1.62	6.37
Epilimnion	5.07	6.35	45.3		11	2.81	3.32	1.31	6.26
Hypolimnion			54.5		15			5.36	6.02
Northeast Inlet			39.5		32			9.37	6.36

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
Conductivity	Stable	Trend not significant; low variability.	Transparency	Degrading	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.